

CQ Inc.'S SOFTWARE FOR PRECOMBUSTION REMOVAL  
OF HAZARDOUS AIR POLLUTANT PRECURSORS

Project Description

America’s coal resources are far greater than the entire world’s supply of oil. The only barrier to increased use of these resources is the impact that coal can have on the environment. Potential new legislation may require abatement of Hazardous Air Pollutant (HAP) emissions from coal-fired power plants, but coal preparation offers an excellent way to remove HAP precursors from the fuel source.

The goal of CQ Inc.’s innovative HAPs-R<sub>x</sub> project is to determine the best and most cost-effective coal-cleaning technology for controlling pollutants. Mercury and selenium, for example, are two particularly troubling elements that cannot be readily removed by current post-combustion technologies. CQ Inc.—in conjunction with Howard University and other partners—is producing a software package called HAPs-R<sub>x</sub>, which will efficiently select the most cost-effective trace element removal processes for specific applications. The U.S. Department of Energy is contributing 75% of the project costs.

The HAPs-R<sub>x</sub> project will quantify the ways in which 12 critical trace elements occur in coal, and the degree to which those elements can be removed by various cleaning processes. This quantification will allow coal producers and users to control economically the disposition of trace elements, ensuring that these elements do not cause air or ground pollution. The research will span a representative range of coal types, with the goal of enhancing current cleaning technologies and developing new technologies.

Laboratory tests and engineering practice studies will culminate in software design. The software will prescribe the most effective integration of proven and promising precombustion technologies to reduce HAP emissions and improve power plant efficiency without substantially increasing fuel costs.

Program Goal

Coal cleaning is a technology that can solve a broad array of environmental problems associated with state-of-the-art and future coal-based power generation, while maintaining the power-generating capacity of the fuel. Research to develop the HAPs-R<sub>x</sub> software will lead to the development of viable precombustion coal-cleaning approaches to meet environmental goals. Coal producers and users would otherwise be limited to less efficient in-furnace and post-combustion technologies for controlling emissions.

PRIMARY PROJECT PARTNER

CQ Inc.  
Homer City, PA

MAIN SITE

CQ Inc.  
Homer City, PA

TOTAL ESTIMATED COST

\$2,497,984

COST SHARING

DOE

\$1,806,386

Non-DOE

\$691,598

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## CONTACT POINTS

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## Project Partners

**HOWARD UNIVERSITY**  
Washington, DC  
(research site)

**FOSSIL FUEL SCIENCES**  
Palo Alto, CA  
(research site)

**STANDARD LABS, INC.**  
Cresson, PA  
(analytical services)

**UNITED STATES GEOLOGICAL SURVEY**  
Reston, VA  
(research site)

## Project Benefits

Precombustion approaches to the removal of hazardous air pollutant precursors have the ability to:

- Benefit all coal-based power-generation systems regardless of specific hardware.
- Improve the efficiency of particulate collection devices without diminishing power output.
- Increase the heating value of delivered coal while reducing transportation, handling, maintenance, and disposal costs.
- Remove mercury and selenium.
- Integrate with any other emissions-reduction technology.
- Meet international emissions standards by removing pollutants prior to shipment.

The benefits of improved coal-cleaning technologies are not limited to environmental issues, but include economic advantages. By meeting international emissions standards prior to shipment, for example, the potential value of U.S. coal is increased.

## Cost Profile (Dollars in Thousands)

	Prior Investment	FY95	FY96	FY97	Future Funds
Department of Energy *	—	\$202	\$250	\$226	\$1,168
Private Sector Partners	—	\$98	\$56	\$84.5	\$453

\* Appropriated Funding

## Key Milestones

FY95	FY96	FY97	FY98	FY99
Planning and Evaluation		Reporting	Finalization	
		Phase I report completed	Engineering models	HAPs-R <sub>x</sub> software